

ENVIRONMENT, HEALTH & SAFETY DIVISION
Occupational Safety Group
Mail Stop 90K

Integrated Functional Appraisal (IFA) Environment, Health & Safety Division

July 17, 2003



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Executive Summary

An Integrated Functional Appraisal (IFA) is performed for each division at Berkeley Lab once every three years. The IFA represents an in-depth technical review of environment, safety, and health (ES&H) activities and issues, with a special emphasis on operations that present the greatest hazards in the division.

This IFA covers all areas with formal work authorizations in the Environment, Health and Safety (EH&S) Division. The EH&S Division has ten Radiation Work Authorizations, four Sealed Source Authorizations, and seven Radiation Work Permits. In addition, the Waste Management function is authorized under a Part B Permit, and relevant safety requirements of the Part B Permit agreement were also reviewed.

Based on the formal work authorizations, we identified and reviewed operations in the following facilities as medium- or high-hazard spaces:

- Bldg 26, Technical Services Group Laboratory
- Bldg 70, Pit Room
- Bldg 70A, Legacy Materials
- Bldg 75A, Calibration Range, Legacy Materials
- Bldg 75C, Calibration Facility
- Bldg 85 and Outbuildings, Hazardous Waste Handling Facility

Lesser-hazard work areas in the Environmental Services Group and in the Fire Department were also covered. All reviews consisted of meetings with the respective managers and physical site visits.

We conclude that the EH&S Division has a solid and robust ES&H program. Work is properly identified and authorized. Employees are properly trained, and there is broad, active participation in the safety processes.

We identify as noteworthy practices the preparation of safety presentations by EH&S Safety Committee members, the authorization process for work in the Environmental Restoration Program, and the manner in which communications for workers in remote sites are assured in the Environmental Services Group.

Compared to the last IFA three years ago, there has been a substantial improvement in ergonomics provisions and in housekeeping, and the number of minor deficiencies has greatly decreased. Most of the deficiencies that were noted are technical or minor issues.

Of the greatest concern is the unsupervised electronics technician working alone on live high-voltage equipment and the continuing lack of seismic anchoring for the gun barrel detector shields in Building 76, Room 135.

Table of Contents

| Section | Page |
|--|-------------|
| 1 Introduction..... | 1 |
| 1.1 IFA Purpose..... | 1 |
| 1.2 Scope..... | 1 |
| 2 Appraisal Process..... | 1 |
| 2.1 Team..... | 1 |
| 2.1.1 Selection..... | 1 |
| 2.1.2 Member Roles and Responsibilities..... | 1 |
| 2.1.3 Meetings..... | 2 |
| 2.2 Defining Appraisal Areas..... | 3 |
| 2.2.1 Document and Database Reviews..... | 3 |
| 2.2.2 Identification of Facility-Level Operations..... | 4 |
| 2.2.3 Identification of Medium- and High-Hazard Spaces and Operations..... | 4 |
| 2.2.4 Identification of Higher Potential Line-Management- Authorized Work: Technical Work Spaces..... | 5 |
| 2.2.5 Identification of Representative Nontechnical Work Spaces..... | 5 |
| 2.2.6 Scheduling of Space Reviews/Inspections..... | 5 |
| 2.3 Space Reviews..... | 5 |
| 2.4 Interviews..... | 5 |
| 3 Findings..... | 6 |
| 3.1 Facility Authorizations..... | 6 |
| 3.1.1 Safety Analysis Documents (SADs), Facility Safety Analysis Documents (FSADs)..... | 6 |
| 3.1.2 Other Bay Area Air Quality Management District (BAAQMD), Environmental Protection Agency (EPA), and East Bay Municipal Utility District (EBMUD) Permits..... | 6 |
| 3.1.3 Status of the Authorizations..... | 6 |
| 3.2 Formal Work Authorizations..... | 7 |
| 3.2.1 Status of Renewals..... | 8 |
| 3.2.2 Current Personnel..... | 8 |
| 3.2.3 Training..... | 8 |

Table of Contents

| Section | Page |
|--|-------------|
| 3.2.4 Authorization Content Reflects Current Conditions and Requirements | 9 |
| 3.2.5 Review of Technical Occupational Safety and Health Issues | 11 |
| 3.2.6 Validation of Hazard Identification Database (HEAR or Equivalent)..... | 11 |
| 3.2.7 Work Smart Standards Envelope..... | 12 |
| 3.3 Line-Management ('Self-Authorization') Space/Operations | 12 |
| 3.3.1 Is Line-Management-Authorized Work Properly Identified?..... | 12 |
| 3.3.2 Validation of Hazard Identification Database (HEAR or Equivalent)..... | 12 |
| 3.4 Nontechnical Space/Operations | 13 |
| 3.5 General Compliance Summary..... | 13 |
| 4 Recommendations..... | 14 |
| 5 Noteworthy Practices..... | 15 |
| 6 Conclusion..... | 15 |

Appendices

Appendix A List of Facility and Formal Authorizations

Appendix B List of Line Management Operations

Appendix C Technical Occupational Safety and Health Inspection Findings

1 Introduction

1.1 IFA Purpose

An Integrated Functional Appraisal (IFA) is performed for each division at Berkeley Lab once every three years. The IFA represents an in-depth technical review of environment, safety, and health (ES&H) activities and issues, with a special emphasis on operations that present the greatest hazards in the division.

1.2 Scope

This IFA covers all areas with formal work authorizations in the Environment, Health and Safety (EH&S) Division. The EH&S Division has a number of radiation-related formal work authorizations. In addition, the Waste Management function is authorized under a State of California Department of Toxic Substances Control permit, commonly referred to as Part B Permit. (Part A of the package comprises the application, including facility safety analysis documents.) Relevant safety requirements of the Part B Permit agreement were also reviewed.

We also covered a selection of lesser-hazard work, as requested in the IFA instructions. The lesser-hazard work areas were in the Environmental Services Group (ESG) and in the Fire Department, and they were covered in conjunction with the 2003 EH&S Division self-assessment.

2 Appraisal Process

2.1 Team

2.1.1 Selection

IFA team members were selected from the EH&S professionals currently assigned to support the EH&S Division. The Medical Director was also invited to be a team member. Also participating was the EH&S Division ES&H Coordinator. A representative from the DOE Berkeley Site Office was invited to participate for Operational Awareness purposes.

2.1.2 Member Roles and Responsibilities

Individual team members were expected to cover issues commensurate with their general expertise and responsibilities:

- Bob Fairchild: Radiation safety

- Larry McLouth: Chemical safety, ventilation, industrial hygiene
- Matt Kotowski: General safety, ergonomics
- Peter Lichty: General safety
- John Chernowski: General safety, waste management

The Team also availed itself of the services of Dawn Banghart and Chris Donahue, Health Physicists, to provide input on the radiation safety issues pertaining to work in the Technical Services Group (TSG) and Calibration Services and Waste Management areas, respectively.

2.1.3 Meetings

The IFA began with an initial meeting on April 29, 2003. The team was joined by Robin Wendt, EH&S Division Deputy, and by Don Van Acker, EH&S Division Safety Committee Chair. Also present were several observers who were on site to certify the Berkeley Lab self-assessment process. During the meeting, available documents and data were reviewed, and the strategy for the IFA was determined.

In addition, the team met and conferred in conjunction with specific site visits. Specifically, the team formally met with Jim Floyd and later with Nancy Rothermich, who own or control most of the formal work authorizations. A separate meeting with Nancy Rothermich was held with a subcommittee consisting of Matt Kotowski and Larry McLouth on June 12 to discuss chemical safety procedures.

A subcommittee consisting of John Chernowski, Matt Kotowski, and Larry McLouth also met with Ron Pauer, Iraj Javandel, and Mike Ruggieri for a joint IFA Self-Assessment review of ESG operations on June 2.

The same sub-team also met with Don Bell, Property Protection and Life Safety (PPLS) Group Leader, on June 9 to review Fire Department and Security operations.

A subcommittee consisting of Robert Fairchild met with Ilham AlMahamid on May 21 to review her work in Building 70A under Radiation Work Permit (RWP) 02-180, and to review her documentation and her work spaces. Everything was in exemplary condition. (Note that this work is carried out in a Chemical Sciences Division laboratory that was reviewed this year as part of the Chemical Sciences IFA and Management of ES&H (MESH))

reviews. In view of these earlier reviews, the committee decided to review only the specific RWP operations in the manner described.)

A final team meeting to discuss the draft report and to provide an out-briefing for the EH&S Division Deputy Director was held on July 17, 2003.

2.2 Defining Appraisal Areas

2.2.1 Document and Database Reviews

The following documentation was assembled and reviewed at the beginning of the IFA:

- EH&S Division 2000 IFA
- Self-Assessment Report summaries, 2000–2002
- AHD Database
- Radiation Work Authorizations (RWAs):
 - RWA 1009 Class II James Floyd
 - RWA 1015 Class II Nancy Rothermich
 - RWA 1015 Class III Nancy Rothermich (suspended)
 - RWA 1092 Class II Gary Zeman
 - RWA 1122 Class III James Floyd
 - RWA 1132 Class I James Floyd
 - RWA 1134 Class III Ilham AlMahamid
 - RWA 1138 Class II Li-Yang Chang
 - RWA 1143 Class II Nancy Rothermich
 - RWA 1144 Class I Gary Zeman
- Sealed Source Authorizations (SSAs):
 - SSA 104 Class I Linnea Wahl
 - SSA 132 Class I Brian Fairchild
 - SSA 202 Class II Dawn Banghart
 - SSA 205 Class III James Floyd
- Radiation Work Permits (RWPs):
 - RWP 02-180 Class III Ilham AlMahamid

- RWP 02-184 Class II Al Smith
- RWP 03-001 Class II Michael Dupray
- RWP 03-002 Class III John Van Wart
- RWP 03-004 Class III Michael Dupray
- RWP 03-005 Class I James Floyd
- RWP 03-007 Class III Chan Ho Yi
- HEAR database
- EH&S Training Database
- Chemical Inventory
- Injury Statistics, 1999–2002

2.2.2 *Identification of Facility-Level Operations*

The Waste Management operation in the Building 85 complex operates under the provisions of a Part B Permit, issued by the State of California. As part of the permitting agreement, operations are covered by detailed procedures; and types of work, maximum quantities, and safety requirements are specified.

The Pit Room, Bldg 70 Room 147/147A, is a radiological storage facility for high activity research materials. Quantities in excess of the DOE-STD 1027 thresholds for Category 3 non-reactor nuclear materials are stored here and a formal safety analysis has been performed and approved by DOE HQ. Based on the engineering and administrative controls in place, that evaluation rated this facility as a radiological facility. All required controls identified in the safety analysis are implemented in the RWA for this facility.

2.2.3 *Identification of Medium- and High-Hazard Spaces and Operations*

Based on the formal work authorizations, we identified the following facilities as medium- or high-hazard spaces:

- Bldg. 26, TSG Laboratory
- Bldg. 70, Pit Room
- Bldg. 75A, Calibration Range and Legacy Materials area
- Bldg. 75C, Calibration Facility
- Bldg. 85 and Outbuildings, Hazardous Waste Handling Facility (HWHF)

The work covered by SSAs was not deemed moderate- or high-hazard work. While some of the areas with SSAs were visited by the team, the documentation review for SSAs was carried out separately by Bob Fairchild, the team's radiation expert.

2.2.4 *Identification of Higher Potential Line-Management-Authorized Work: Technical Work Spaces*

The IFA Team also decided to review work in the PPLS Group and in the ESG as representative of hazards presented elsewhere in the Division.

The PPLS Group was chosen because it encompasses the firehouse and contracted operations involving the Fire Department and Security forces; ESG was chosen because it performs fieldwork at and around the Laboratory.

These areas were evaluated in conjunction with the EH&S Self-Assessment by a sub-team consisting of Matt Kotowski, Larry McLouth, and John Chernowski.

Finally, the team deputized Bob Fairchild, the radiation specialist on the team, to review the documentation and the swipe testing records for all sealed sources.

2.2.5 *Identification of Representative Nontechnical Work Spaces*

Office spaces were included in the inspection of the PPLS Group and ESG.

2.2.6 *Scheduling of Space Reviews/Inspections*

Inspections, reviews, and interviews were scheduled with the respective managers.

2.3 Space Reviews

Space reviews consisted of IFA Team walkthroughs of the spaces in the company of the respective managers. Findings were discussed with the respective manager at the time and on completion of the walkthrough.

2.4 Interviews

Prior to inspections and walkthroughs, the IFA Team met with the respective managers to review formal authorizations and operations in general. Where work authorizations covered some or all of the work, they were reviewed in detail with the respective manager at this time. Additional personnel were present when invited by the manager.

3 Findings

3.1 Facility Authorizations

3.1.1 *Safety Analysis Documents (SADs), Facility Safety Analysis Documents (FSADs)*

The Hazardous Waste Handling Facility (HWHF) at Building 85 operates under a Part B Permit, issued by the State of California. An FSAD documents the detailed requirements for the work authorized by the permit.

3.1.2 *Other Bay Area Air Quality Management District (BAAQMD), Environmental Protection Agency (EPA), and East Bay Municipal Utility District (EBMUD) Permits*

The EH&S Division holds one EBMUD permit for the wastewater treatment associated with the site restoration process. In this process, groundwater is collected and treated to remove chemical contaminants, and the water is then discharged into the sewer.

There are also three separate BAAQMD permits associated with the soil vapor extraction systems associated with the site remediation work near Buildings 6, 7E, and 58. In these systems air is pumped from the ground above contaminated groundwater, the air is passed through activated charcoal canisters to remove organic vapors, and the air is then returned to the atmosphere.

3.1.3 *Status of the Authorizations*

The Waste Management permit and associated procedures are continuously updated and monitored, and they are periodically renewed. This process is managed by the Waste Management Group Leader, with assistance from the LBNL environmental attorney. The documentation is current.

Per Ginny Lackner, ESG water specialist, the work associated with the site restoration water treatment permit has been reviewed on several occasions by the regulatory agency and was always found to be satisfactory.

Similarly, according to Pat Thorson, ESG air quality specialist, the soil vapor extraction systems have been inspected at various times by BAAQMD and have been found satisfactory in every case.

3.2 Formal Work Authorizations

Most work authorizations in the EH&S Division relate to radioactive materials. Radioactive Work Authorizations (RWAs) apply to ongoing work with radioactive materials; Radiation Work Permits (RWPs) apply to one-time activities involving radioactive materials; and use or possession of sealed radioactive sources is governed by Sealed Source Authorizations (SSAs).

Below is a complete list of work authorizations held by the EH&S Division, along with the class level and holder of each authorization.

- RWA 1009 Class II James Floyd
- RWA 1015 Class II Nancy Rothermich
- RWA 1015 Class III Nancy Rothermich (suspended)
- RWA 1092 Class II Gary Zeman
- RWA 1122 Class III James Floyd
- RWA 1132 Class I James Floyd
- RWA 1134 Class III Ilham AlMahamid
- RWA 1138 Class II Li-Yang Chang
- RWA 1143 Class II Nancy Rothermich
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- SSA 104 Class I Linnea Wahl
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- RWP 02-184 Class II Al Smith
- RWP 03-001 Class II Michael Dupray
- RWP 03-002 Class III John Van Wart
- RWP 03-004 Class III Michael Dupray
- RWP 03-005 Class I James Floyd
- RWP 03-007 Class III Chan Ho Yi

In addition to these formal work authorizations, formal limitations are imposed on the operation of the HWHF under the provisions of the Part

B Permit. These limitations are enumerated in Section 5.1.1, "Operational Procedures and Limitations," of the *Final Safety Analysis Document for the Hazardous Waste Handling Facility*.

Note that the Environmental Restoration project has implemented a formal procedure process for projects involving environmental restoration activities by Facilities personnel. Such projects are reviewed by the Industrial Hygienist, who verifies that ES&H requirements are followed, in particular those relating to ventilation, personal protective equipment, and dig permits.

3.2.1 Status of Renewals

All RWAs, RWPs, and SSAs were found to be current. Class III work under RWA 1015 at the HWHF is formally suspended at this time, and Class III work in the Waste Management Group is presently covered by individual RWPs, which are created as the need arises.

The limitations in Section 5.1.1, "Operational Procedures and Limitations," of the *Final Safety Analysis Document for the Hazardous Waste Handling Facility* have no expiration dates.

3.2.2 Current Personnel

Personnel performing work under RWAs and RWPs are individually listed in the respective authorizations, and the health physicist assigned to the particular group verifies their training and competence initially and on a periodic basis.

The SSAs do not necessarily authorize specific work. They authorize the storage of specific sources in specific locations and specify the required leak testing. For low-hazard work, they may also authorize the work. For higher-hazard work (e.g., the Cobalt Irradiator), a separate RWA authorizes the actual work.

3.2.3 Training

Training for each RWA is documented in the RWA binder, or the binder points to the location of the training records. The training records are reviewed periodically by the responsible health physicist. Training mandated for RWAs and RWPs is verified by the health physicist at the time. The radiation protection specialist on the team verified that this was documented properly.

Training for work at the HWHF is tracked in individual binders, as required by the Part B Permit. The training includes Hazardous Waste Operations and Emergency Response (HAZWOPER) training, as well as the usual LBNL EH&S training. New personnel

are restricted in their activities until all required training is completed. The training records are reviewed by the Waste Management Group Leader periodically, to verify that required retraining takes place on a timely basis. These training records are also reviewed as part of the Part B Permit maintenance. The IFA Team performed a spot check of the training binders and found the system satisfactory. The only discrepancy noted was that the cross-reference to the training binders was missing in the RWA 1015 binder, contrary to the RWP requirements.

In general, EH&S staff is current on their required training. Training completion runs at 95%, one of the highest rates at the Laboratory. As of July 3, 2003, only seven individuals have overdue required training. All of the overdue training is less than two months delinquent.

3.2.4 *Authorization Content Reflects Current Conditions and Requirements*

All formal authorizations were current.

The Waste Management Part B Permit and associated documents and procedures are closely monitored by the Waste Management Group Leader, as well as by the Laboratory Environmental Attorney and the State of California.

Chemical safety requirements in the FSAD documentation are incorporated into the detailed operating procedures of the Waste Management Group, as shown on the table on the following page.

RWA and RWP work is monitored by the health physicist assigned to the particular operation, and management cannot make changes without Health Physics Group approval. The same is true for sealed source authorizations.

The air and water permits for the Environmental Restoration work cover stable operations. The operations have been reviewed on several occasions by the environmental specialists and by state agencies, and they were found to reflect permit limitations appropriately.

FSAD Chemical Safety Requirements for the HWHF

| Operational Procedures and Limitations | Implementation |
|--|--|
| Liquid chemical wastes shall not be packaged or handled in primary containers greater than 55 gallons. | Reflected in waste acceptance criteria. Only larger containers on site are 85 gallon overpacks. |
| The inventory of chemical quantities will be managed so as not to permit potential onsite or offsite exposures to exceed ERPG-2 levels or equivalent. | Met by not having more than 55 gallons of any single chemical in a container. |
| The radioactive material inventory will be managed as a Non-Nuclear Facility such that the sum of the fractions does not exceed unity. For such calculations, the current Cat. 3 thresholds in DOE-STD-1027 will be used. | The monthly ShoeBox (the Waste Management Group database) report reflecting the sum of the fractions is posted in Building 85B; it usually runs at 0.6 or 0.7. A ShoeBox trial run is performed before any incoming shipments of actinides are accepted to verify continuing compliance. |
| Single shipments of tritium to the HWHF will not exceed 700 Ci. | Moot. The NTLF has closed. |
| The amount of alpha-emitting radionuclides stored in metal drums within any individual mixed or radioactive waste storage area will be limited to 440 mCi. The limit per area for alpha emitters outside of metal drums is 88 mCi. | A ShoeBox 1027 report is run monthly to verify this. The highest number ever reported for any waste storage area has been 79 mCi. |
| Consolidated mixed waste drums will not be stacked on the upper tier of drum pallets in MW4. | Only lab-packed waste is stacked, not drums. This is verified by weekly group leader reviews. |
| Total pyrophoric waste in HW6 will not exceed 4 lb. | Pyrophoric waste is rarely received, and it is checked during weekly group leader reviews. |
| All palleted 55 gallon drums will be banded together | Signs are posted, and this requirement is verified by weekly group leader reviews. |

| Operational Procedures and Limitations | Implementation |
|--|--|
| Drums containing consolidated flammable liquids if double stacked in facility will meet UN and DOT regulations to survive a 4 ft fall. | Drums are not stacked. |
| <p>Systems important to safety identified in Chapter 4 of the FSAD must be demonstrated to be operable in accordance with associated fire codes. These systems are:</p> <ul style="list-style-type: none">- Fire sprinkler/foam systems- Maintenance, testing, and inspection of the suppression system will be performed in accordance with NFPA 25.- Maintenance, testing, and inspection of the alarm and fire detection system will be performed in accordance with NFPA 72.- Emergency power generator- Maintenance, testing, and inspection of the emergency power system (EPS) will be performed in accordance with NFPA 110. | All these services are performed routinely by the Facilities Division. It is not clear whether compliance with the cited NFPA standards has been verified. |

3.2.5 Review of Technical Occupational Safety and Health Issues

Overall, ES&H conditions in the workspaces were found to be very good.

No significant violations were noted, and the level of minor deficiencies found had noticeably improved over prior IFAs. (The level was satisfactory even then.)

3.2.6 Validation of Hazard Identification Database (HEAR or Equivalent)

EH&S maintenance of hazards and self-authorizations (the HEAR database) is exemplary. All spaces in the Division are entered, and virtually all have been verified and re-approved within the last 12

months. Only one incorrect entry was noted, an obvious oversight that does not affect the accuracy of hazards recorded.

3.2.7 *Work Smart Standards Envelope*

The nature of the work in the EH&S Division has not changed since the last IFA, and all work is satisfactorily covered by the Work Smart Standards envelope. The respective standards have not changed in any way that would affect compliance for the work carried out within the EH&S Division.

3.3 Line-Management ('Self-Authorization') Space/Operations

Most of the work in the EH&S Division is self-authorized in accordance with the Division ISM Plan and documented through the HEAR database authorization process.

Field work in the Environmental Restoration Program is authorized through an internal procedure process, as discussed earlier.

Virtually all work in the Waste Management Group is governed by written procedures, as specified in the FSAD documentation, and these procedures are reviewed and re-approved on a two-year cycle.

3.3.1 *Is Line-Management-Authorized Work Properly Identified?*

The review process for line-management authorization appears to be functioning appropriately. In the case of the Environmental Restoration work plans, the division process exceeds Laboratory requirements.

One possible deficiency is work under Waste Management Procedure 852, *Onsite Transportation and Desensitization of Reactive Hazardous and Mixed Wastes*. This is work meeting the criteria for an AHD under the requirements of LBNL/PUB-3000. While the work and attendant hazards and precautions appear to be appropriately described in the procedure, the review and approval process lack the formality of an AHD review. It is therefore recommended that this procedure be reviewed, approved, and tracked as an AHD.

Another technical deficiency is the review of the safety plans for the Fire Department and for the Security Services.

3.3.2 *Validation of Hazard Identification Database (HEAR or Equivalent)*

The HEAR database appears to be current and accurate. Spot checks revealed only one deficiency, a room where the responsible

individual had not been updated. No deficiencies with respect to hazards were noted.

3.4 Nontechnical Space/Operations

A subset of the IFA team visited office spaces in ESG and in the PPLS Group. Also visited were the living quarters for firefighters, the firehouse, and the guard shacks at the entrances.

No deficiencies were noted in any of the offices for PPLS or ESG. The Fire Department living quarters were noticeably more orderly than in prior years.

3.5 General Compliance Summary

The EH&S Division appears to be fully in compliance with all applicable hazard review and approval requirements. The required approvals exist, and they have been reviewed and updated in a timely fashion. Recommendations are made with respect to two minor procedural items in the Waste Management Group.

4 Recommendations

1. LBNL contracts require service contractor safety plans to be approved by the EH&S Division Field Support Department. Safety plans for Barton Security and for the Alameda County Fire Department have been received and reviewed by the PPLS group leader only. It is recommended that the contractor safety plans be submitted to Peter Lichty, successor to Field Support, for approval.
2. Work carried out under Waste Management Procedure # 852 "Onsite Transportation and Desensitization of Reactive Hazardous and Mixed Wastes" meets the criteria for an AHD under the requirements of PUB-3000. While the work and attendant hazards and precautions appear to be appropriately described in the procedure, the review and approval process lack the formality of an AHD review. Waste Management Procedure # 852 "Onsite Transportation and Desensitization of Reactive Hazardous and Mixed Wastes" should be reviewed, approved and tracked as an Activity Hazard Document.
3. Electronics repair work in Bldg 75, including testing and trouble shooting of high voltage equipment, is performed by an electronics technician working without supervision and without other people in the room, in apparent conflict with LBNL electrical safety requirements. A thorough review of the work and procedures by the electrical safety engineer, Tom Caronna, should be requested.
4. The gun barrel shields for the radiation detectors in Bldg 76 still lack seismic anchoring. This item is on an institutional priority list, and there are plans to relocate this facility to a different building whereby anchoring would be part of the relocation. If the facility does not move within a reasonable time frame, the anchoring should be undertaken in this location.
5. Fire sprinkler/foam systems, alarm and fire detection system, and the emergency power generator in the Hazardous Waste Management Facility are required to be maintained, tested and inspected in accordance with NFPA 25, NFPA 72 and NFPA 110 respectively. The Waste Management Facility Manager was not certain whether current Facilities Department procedures met these criteria. The LBNL Fire Protection Engineer should be requested to review the current inspection and maintenance practices to verify they comply with the respective NFPA standards.

5 Noteworthy Practices

The manner in which Environmental Restoration projects involving physical labor are documented, reviewed, and authorized constitutes a noteworthy practice. The process assures that there is full communication between the Site Restoration staff and the individuals who will actually be performing the work, as well as the industrial hygienist who oversees the safety requirements for these jobs.

The EH&S Division Safety Committee has initiated a practice whereby members of the Safety Committee take turns in developing PowerPoint safety presentations, which are then used by the other members of the safety committee in their respective group meetings. These presentations are also made available on the Web to other safety committees at the Laboratory.

The manner in which work at remote work sites is managed is noteworthy. Cell phones must be carried for emergency communications, and a two-person rule is in effect for all sampling at locations where cell phones are out of range.

6 Conclusion

The EH&S Division has a solid and robust EH&S program. Work is properly identified and authorized. Employees are properly trained, and there is broad, active participation in the safety processes.

Compared to the last IFA three years ago, there has been a substantial improvement in ergonomics provisions and in housekeeping, and the number of minor deficiencies has decreased greatly. Most of the deficiencies that were noted are technical or minor issues.

Of the greatest concern is the unsupervised electronics technician working alone on live high-voltage equipment and the continuing lack of seismic anchoring for the gun barrel detector shields in Building 76, Room 135.

Appendices

Appendix A List of Facility and Formal Authorizations

Appendix B List of Line Management Operations

Appendix C Technical Occupational Safety and Health Inspection Findings

Appendix A List of Facility and Formal Authorizations

The HWHF at Building 85 operates under a Part B Permit, issued by the State of California. An FSAD documents the detailed requirements for the work authorized by the permit.

The EH&S Division holds one EBMUD permit for the wastewater treatment associated with the site restoration process. In this process, groundwater is collected and treated to remove chemical contaminants, and the water is then discharged into the sanitary sewer.

There are also three separate BAAQMD permits associated with the soil vapor extraction systems associated with the site remediation work near Buildings 6, 7E, and 58. In these systems air is pumped from the ground above contaminated groundwater, the air is passed through activated charcoal canisters to remove organic vapors, and the air is then returned to the atmosphere.

LBL formal work authorizations in the EH&S Division relate to radioactive materials. Radioactive Work Authorizations (RWAs) apply to ongoing work with radioactive materials; Radiation Work Permits (RWPs) apply to one-time activities involving radioactive materials; and Sealed Source Authorizations (SSAs) govern use or possession of sealed radioactive sources.

Below is a complete list of work authorizations held by the EH&S Division, along with the class level and holder of each authorization.

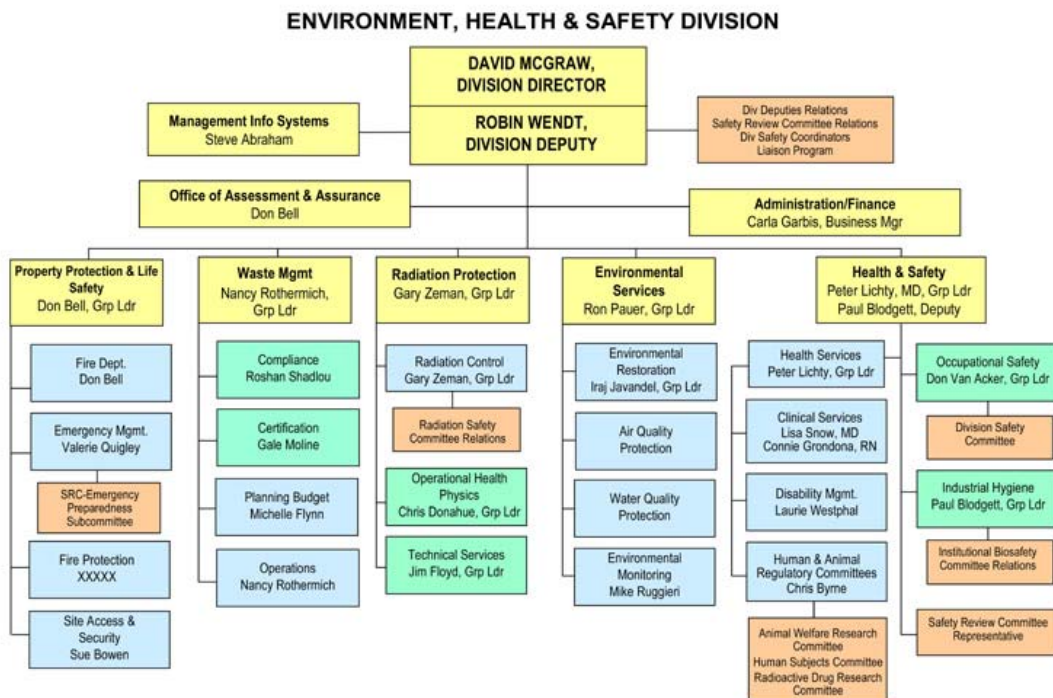
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- RWP 03-004 Class III Michael Dupray
- RWP 03-005 Class I James Floyd
- RWP 03-007 Class III Chan Ho Yi

In addition to these formal work authorizations, formal limitations are imposed on the operation of the HWHF under the provisions of the Part B Permit. These limitations are enumerated in Section 5.1.1, "Operational Procedures and Limitations," of the *Final Safety Analysis Document for the Hazardous Waste Handling Facility*.

Appendix B List of Line Management Operations

The EH&S Division provides a full range of EH&S support functions, as shown in the organization chart.



5/03

Authorization to carry out this work is provided in Section 5 of the EH&S Division ISM Plan:

5.0 Scope of Work Authorized

- A. **General.** The primary objective of the Environment, Health and Safety (EH&S) Division is to protect workers, the public, and our environment by providing professional and technical expertise, follow-on services, and integrated ES&H policy to the Lab's research and support programs. The EH&S Division supports and acts as a partner with line management as it meets direct responsibilities to ensure that protection of workers, the public, and the environment is integrated into the primary research and support functions of each division or unit. Of equal importance, the EH&S Division supports and provides expertise directly to each Lab worker who seeks ES&H advice and help, or who voices a concern. The Environment, Health and Safety Division Charter (Appendix II) defines the scope of work for all EH&S personnel (including contractors).

The Lab-wide Hazards, Equipment, Authorizations and Review (HEAR) system, associated with the Work Smart Standards initiative and subsequent Integrated Functional Appraisals (IFA), list the workplace hazards intrinsic to the activity being performed by Division personnel (Appendix III).

- B. **Work Requiring Specific Approval.** Division group leaders will prepare EH&S documentation and obtain required authorizations for potentially hazardous or regulated work using the guidance specified in Chapter 6 of PUB-3000 prior to commencement of the work. Current EH&S Division work authorizations are listed in Appendix IV. Department heads and group leaders are responsible for the annual review of authorizations within their jurisdiction. Authorization reviews and corresponding hazards should be recorded in the HEAR database.

The Hazardous Waste Handling Facility (HWHF), B85, operates under a Part B permit; its facility safety analysis is documented in the Final Safety Analysis Document (FSAD) which cite Operational Safety Requirements (OSR's). The OSR's define the operating safety envelope for the facility. Waste Management is responsible for operating the facility in accordance with its OSR's and is held accountable to the Division Director. The Waste Facility's safety documentation supercedes the need for an AHD.

Currently, under requirements of 10 CFR 830, the HWHF, Building 70 room 147 (Pit Room), and Building 75C (calibration facility) are categorized as Radiological Facilities.

The Division self authorizes work when hazards are below authorization thresholds through its work procedures. Throughout the Division, specific safety concerns and hazards are identified and controls (engineering and / or administrative) appropriate to the hazard and tailored to the work are described in the work procedures. Group leaders are required to annually document hazards inherent in self-authorized work in the HEAR database.

Appendix C Technical Occupational Safety and Health Inspection Findings

| Building or Group | Room | Finding | Action |
|-------------------|------|---|--|
| PPLS | | LBNL contracts require service contractor safety plans to be approved by the EH&S Division Field Support Department. Safety plans for Barton Security and for the Alameda County Fire Department have been received and reviewed by the PPLS Group Leader only. | Submit contractor safety plans to Peter Lichty, successor to Field Support, for approval. |
| Waste Management | | Work carried out under Waste Management Procedure 852, <i>Onsite Transportation and Desensitization of Reactive Hazardous and Mixed Wastes</i> , meets the criteria for an Activity Hazard Document (AHD) under the requirements of LBNL/PUB-3000. While the work and attendant hazards and precautions appear to be appropriately described in the procedure, the review and approval process lack the formality of an AHD review. | Waste Management Procedure 852, <i>Onsite Transportation and Desensitization of Reactive Hazardous and Mixed Wastes</i> , should be reviewed, approved, and tracked as an AHD. |

| Building or Group | Room | Finding | Action |
|-------------------|------|---|--|
| 70 | | An unused radiation detector was found that was two years out of date on its calibration. | The meter was removed from service. |
| 75 | 121 | Electronics repair work, including testing and trouble shooting of high-voltage equipment, is performed by an electronics technician working without supervision or other individuals in the room, in apparent conflict with LBNL electrical safety requirements. | Request a thorough review of the work and procedures by the electrical safety engineer, Tom Caronna. |
| 75 | 121 | The seismic restraint chains on the shelves were mounted too high to restrain the material stored. | Reinstall the chains at the appropriate height. |
| 75A | | The eyewash and safety shower were last checked 3/02. | Remind Facilities to include this unit in their routine testing service. |
| 76 | 135 | The gun-barrel shields for the radiation detectors still lack seismic anchoring. | This item is on an institutional priority list, and there are plans to relocate this facility to a different building, and anchoring would be part of the relocation. If the facility does not move within a reasonable time frame, the anchoring should be undertaken in this location. |
| 76 | 135 | There is no seismic restraint for the Liquid Scintillation Counter. | Provide seismic restraint. |

| Building or Group | Room | Finding | Action |
|-------------------|------|--|--|
| 76 | 135 | The resilient floor mats have aged and are getting hard. | Replace resilient floor mats. |
| 85 | | The cross-reference to the training binders was missing in the RWA 1015 binder, contrary to the RWP requirements. | Insert cross reference into RWP binder. |
| 85 | | Fire sprinkler/foam systems, alarm and fire detection system, and the emergency power generator are required to be maintained, tested, and inspected in accordance with NFPA 25, NFPA 72, and NFPA 110, respectively. The Waste Management Facility Manager was not certain whether current Facilities Department procedures met these criteria. | Request that the LBNL Fire Protection Engineer review the current inspection and maintenance practices to verify they comply with the respective NFPA standards. |